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PATENT APPLICATION

ATTORNEY DOCKET NO. 200311582-1

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Alan R. Arthur et al.

Confirmation No.: 7536

Application No.: 10/686,896

Examiner: CHUO, Tony Sheng Hsiang

Filing Date: October 15, 2003

Group Art Unit: 1745

Title: Calibration Feedback-Control Circuit for Diffraction Light Devices

Mail Stop Appeal Brief-Patents
Commissioner For Patents
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TRANSMITTAL OF APPEAL BRIEF

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on October 23, 2006.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) $500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

☐ (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d)) for the total number of months checked below:

☐ 1st Month $120	☐ 2nd Month $450	☐ 3rd Month $1020	☐ 4th Month $1590

☐ The extension fee has already been filed in this application.

☒ (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

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Rev 10/05 (AplBrief)

Application No.: 10/686,896 Attorney Docket No.: 200311582-1

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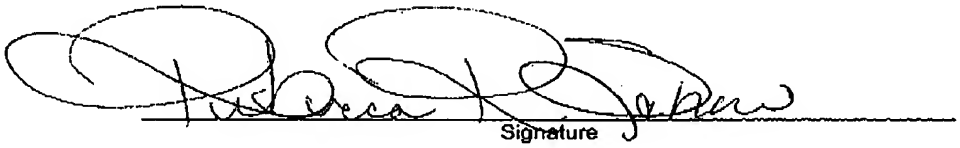

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1. Transmittal of Appeal Brief with Duplicate Copy (2 pages)
2. Certificate of Transmission (1 page)
3. Appeal Brief (21 pages)

200311582-1 10/686,896

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the Patent Application of

Alan R. Arthur et al.

Application No. 10/686,896

Filed: October 15, 2003

For: Multi-Cell Fuel Cell Layer and System

Group Art Unit: 1746

Examiner: CHUO, Tony Sheng Hsiang

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is an Appeal Brief under Rule 41.37 appealing the decision of the Primary Examiner dated August 30, 2006. Each of the topics required by Rule 41.37 is presented herewith and is labeled appropriately.

12/21/2006 NNGUYEN1 00000083 082025 10686896
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I. Real Party in Interest

The real party in interest is Hewlett-Packard Development Company, LP, a limited partnership established under the laws of the State of Texas and having a principal place of business at 20555 S.H. 249 Houston, TX 77070, U.S.A. (hereinafter "HPDC"). HPDC is a Texas limited partnership and is a wholly-owned affiliate of Hewlett-Packard Company, a Delaware Corporation, headquartered in Palo Alto, CA. The general or managing partner of HPDC is HPQ Holdings, LLC.

II. Related Appeals and Interferences

There are no appeals or interferences related to the present application of which the Appellants are aware.

III. Status of Claims

Claims 39-60 have been withdrawn under the imposition of a previous Restriction Requirement and are not at issue. Claims 1-38 and 61-65 are pending in this appeal. Claims 8 and 25-28 have been indicated as containing allowable subject matter. Claims 1-7, 9-24, 29-38 and 61-65 have been finally rejected. Accordingly, Appellant appeals from the rejection of claims 1-7, 9-24, 29-38 and 61-65, which claims are presented in the Appendix.

IV. Status of Amendments

No amendments have been filed subsequent to the final Office Action of August 30, 2006, from which Appellant takes this appeal.

V. Summary of Claimed Subject Matter

During the past several years, the popularity and viability of fuel cells for producing both large and small amounts of electricity has increased significantly. Fuel cells conduct an electrochemical reaction with reactants such as hydrogen and oxygen to produce electricity and heat. A typical fuel cell includes an electrolyte disposed between two electrodes: an anode and a cathode. (Appellant's specification, paragraph 0001).

Appellant's specification describes a fuel cell layer that includes a substrate; an array of fuel cells each having an anode, a cathode, and an electrolyte, disposed on the substrate; conductors electrically coupled to the fuel cell array; a fuel flow channel defined in an anode side of the substrate, and a cathode air flow channel defined in a cathode side of the substrate. (Appellant's specification, paragraph 0016).

Fig. 1A illustrates the cathode side (115), in which a cathode air flow channel (125) is defined in the substrate (110). The cathode air flow channel (125) is a depression, trench, channel or the like formed in the substrate (110) and which runs between, and is in fluid communication with, a cathode air inlet (130) and an excess cathode air outlet (135). The width of the channel (125) accommodates the array of fuel cells (105). As shown in Fig. 1A, the cathode air inlet (130) and excess cathode air outlet (135) are located in opposing corners of the substrate (110). The cathode air flow channel (125) includes an air flow axis (140). During operation, the cathode air flows through the cathode air flow channel (125) in a direction that is generally parallel to the air flow axis (140). The cathode air flows from the cathode air inlet (130) through the cathode air flow channel (125) and out the excess cathode air outlet (135) while also flowing across the individual fuel cells (105). (Appellant's specification, paragraph 0019).

To enhance fuel or air flow over the fuel cell layer (100), flow modification features, such as an array of baffles (185), may be placed in the fuel and/or air streams. Such flow modification features may provide improved fuel cell layer performance by increasing the turbulence of the fuel and air streams, or adjusting the spatial distribution of the flow in the plane of either the air or fuel flows. These modification features (185) can be designed to achieve uniform flow fields across both sides of the fuel cell layer (100). (Appellant's specification, paragraph 0023).

Turning to specific claims, claim 1 recites:

A multi-cell fuel cell layer (*Appellant's specification, paragraph 0016)*, comprising:

a substrate (110);

an array of fuel cells (145) each having an anode, a cathode, and an electrolyte disposed on said substrate (110);

conductors (150, 155) electrically coupled to said fuel cell array (145);

a fuel flow channel (160) defined in an anode side (120) of said substrate (110); and

a cathode air flow channel (125) defined in a cathode side (115) of said substrate (110) (*Appellant's specification, paragraph 0019).*

Independent claim 16 similarly recites:

A fuel cell system, comprising:

a plurality of fuel cell layers (*Appellant's specification, paragraph 0016)* each including an array of fuel cells (145) each having an anode, a cathode, an electrolyte and conductors disposed on a substrate (110), a fuel flow channel (160) defined in an anode side (120) of said substrate (110), and a cathode air flow channel (125) defined in a cathode side (115) of said substrate (110),

wherein said fuel cell layers are alternatingly stacked (*Appellant's specification, paragraph 0028).*

Independent claim 61 recites

An electrochemical system (*Appellant's specification, paragraph 0016)*, comprising:

means (110) for supporting an array of fuel cells (145);

means (125) defined in a first side (115) of said support means (110) for conveying cathode air across said array of fuel cells (145); and

means (160) defined in a second side (120) of said support means (110) for conveying fuel across said array of fuel cells (145) (*Appellant's specification, paragraph 0019.*

VI. Grounds of Rejection to be Reviewed on Appeal

In the final Office Action of August 30, 2006, the following grounds of rejection were raised.

(1) Claims 1-3, 11, 12, 16, 33, 34, 36 and 61-64 were rejected under 35 U.S.C. § 102(a) and (e) as being anticipated by U.S. Patent Application Publication No. 2003/0022051 to Haluzak ("Haluzak").

(2) Claims 4-7 were rejected under 35 U.S.C. § 103(a) over the combined teachings of Haluzak and U.S. Patent No. 5,773,160 to Wilkinson et al. ("Wilkinson").

(3) Claims 9, 10, 30-32 and 65 were rejected under 35 U.S.C. § 103(a) over the combined teachings of Haluzak and JP 08-213043 to Takayanagi ("Takayanagi").

(4) Claims 13 and 14 were rejected under 35 U.S.C. § 103(a) over the combined teachings of Haluzak and U.S. Patent No. 6,832,647 to Voss et al. ("Voss").

(5) Claim 15 was rejected under 35 U.S.C. § 103(a) over the teachings of Haluzak taken alone.

(6) Claims 17-21 were rejected under 35 U.S.C. § 103(a) over the combined teachings of Haluzak and Takayanagi.

(7) Claims 22-24 were rejected under 35 U.S.C. § 103(a) over the combined teachings of Haluzak, Takayanagi and Wilkinson.

(8) Claim 29 was rejected under 35 U.S.C. § 103(a) over the combined teachings of Haluzak and U.S. Patent No. 6,503,651 to Nguyen ("Nguyen").

(9) Claim 35 was rejected under 35 U.S.C. § 103(a) over the teachings of Haluzak and U.S. Patent Application Pub. No. 20030235745 to Mook et al. ("Mook").

(10) Claims 37-38 were rejected under 35 U.S.C. § 103(a) over the combined teachings of Haluzak, Takayanagi, Wilkinson and Nguyen.

Accordingly, Appellant requests review of these grounds of rejection in the current appeal.

VII. Argument

Claims 1, 16 and 61 are clearly patentable over Haluzak:

Claim 1 recites:

> A multi-cell fuel cell layer, comprising:
> a substrate;
> an array of fuel cells each having an anode, a cathode, and an electrolyte disposed on said substrate;
> conductors electrically coupled to said fuel cell array;
> a fuel flow channel defined in an anode side of said substrate; and
> *a cathode air flow channel defined in a cathode side of said substrate.*

(Emphasis added).

Independent claim 16 similarly recites:

> A fuel cell system, comprising:
> a plurality of fuel cell layers each including an array of fuel cells each having an anode, a cathode, an electrolyte and conductors disposed on a substrate, a fuel flow channel defined in an anode side of said substrate, and *a cathode air flow channel defined in a cathode side of said substrate,*
> wherein said fuel cell layers are alternatingly stacked.

(Emphasis added).

Independent claim 61 recites

> An electrochemical system, comprising:
> means for supporting an array of fuel cells;

means defined in a first side of said support means for conveying cathode air across said array of fuel cells; and

means defined in a second side of said support means for conveying fuel across said array of fuel cells.

(Emphasis added).

In contrast, Haluzak does not teach or suggest the claimed fuel cell layer or system in which a fuel flow channel is defined in one side of a substrate and a cathode air flow channel is defined in a second side of the substrate.

As shown in Figs. 4 and 5, each layer of the Haluzak system includes a substrate (62) which may be, for example, a silicon wafer. (Haluzak, paragraph 0025). Fuel cells, including the anode (50), electrolyte (42) and cathode (48), are formed on the substrate (62). (Haluzak, paragraph 0023). Fuel chambers (52) are formed or defined in, and extend through, the substrate (62). (Haluzak, paragraph 0025). ***However, there is no cathode air flow channel that is similarly defined in an opposite or cathode side of the substrate.***

To the contrary, as clearly shown in Figs. 4-6, the fuel cells (50, 42, 48) are formed on one side of the substrates (62). The substrates are then stacked and placed in a frame (80) so as to allow air chambers (54) to exist *between the substrates*. However, there is no cathode air flow channel *defined in a cathode side of the substrate* as claimed.

In this regard, the final Office Action of August 30, 2006 argues that "figures 4 and 5 do show fuel flow channels '52' defined on anode side of the substrate and cathode air flow channels defined on the cathode side of the substrate." (Action of 8/30/06, p. 9). It is significant that the Action gives no citation to any element or portion of Haluzak when asserting that Haluzak teaches cathode air flow channels defined on the cathode side of the substrate. Moreover, Appellant's claims call for a cathode air flow channel defined in, not on, the cathode side of the substrate. Thus, the Office Action is not even correctly alleging that the claimed subject matter is taught by Haluzak. Most importantly, as demonstrated

above, Figs. 4 and 5 of Haluzak are mischaracterized by the Office Action and do not, in fact, teach or suggest any "cathode air flow channel ***defined in*** a cathode side of said substrate." (Emphasis added).

A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. For at least this reason, the rejection of all the pending claims should not be sustained.

Claim 4 is clearly patentable over Haluzak and Wilkinson:

Claim 4 further recites "a cathode air inlet and an excess cathode air outlet defined in said substrate." The Office Action concedes that Haluzak does not teach this subject matter. (Action of 8/30/06, p. 4). Consequently, the Action cites to Wilkinson in this regard, particularly Wilkinson's teachings in Figs. 6A and 6B.

However, in these figures, Wilkinson is not teaching a layer of a fuel cell stack or a substrate on which fuel cells are disposed. Rather, Figs. 6A and 6B of Wilkinson illustrate a coolant fluid flow plate for use in cooling a fuel cell stack. (Wilkinson, col. 9, lines 20-29). According to Wilkinson, a "coolant flow field plate 98 is inserted at regular intervals [between the fuel cells] to provide a cooling layer ... for removing heat generated by the electrochemical reaction occurring in the cells of the active section." (Wilkinson, col. 10, lines 55-59).

Thus, as cited by the Office Action, Wilkinson teaches a coolant flow plate that includes an air inlet and outlet. Wilkinson does not teach or suggest a fuel cell layer in which

a substrate, on which are disposed an array of fuel cells, includes the air inlet and outlet as recited in claim 4. Neither cited reference teaches this subject matter.

In response to this argument, the final Office Action concedes this failing of the Wilkinson reference, but argues that "the Wilkinson reference does not have to teach an array of fuel cells disposed on a substrate because it is a secondary reference that is used to modify the primary reference." (Action of 8/30/06, p. 9). Appellant recognizes that Wilkinson is a secondary reference used to modify the primary reference of Haluzak. However, this does not give the Examiner license to read teachings into the prior art that are not there.

As demonstrated above, Wilkinson teaches a coolant flow plate that includes an air inlet and outlet. Thus, if the teachings of Wilkinson are combined with those of Haluzak, the result is that Haluzak gets a *coolant flow plate* that includes an air inlet and outlet. Neither reference teaches or remotely suggests the cathode air inlet and excess cathode air outlet defined *in the substrate that is supporting a fuel cell array* as claimed. Simply because the Examiner is combining two prior art references, does not mean the Examiner can somehow read this entirely new subject matter into the combination when neither of the references teaches or suggests any such thing.

The final Office Action fails to indicate how or where the cited prior art teaches or suggest the subject matter of claim 4. "To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)." M.P.E.P. § 2143.03. Accord. M.P.E.P. § 706.02(j). For at least this reason, the rejection of claims 4-7 should not be sustained.

Claim 7 is clearly patentable over Haluzak and Wilkinson:

Claim 7 now recites that "said array of fuel cells are disposed within said fuel flow channel and said cathode air flow channel." This subject matter is not taught or suggested by the prior art of record. "To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)." M.P.E.P. § 2143.03. Accord. M.P.E.P. § 706.02(j). For at least this additional reason, the rejection of claim 7 should not be sustained.

Claims 13 and 14 are clearly patentable over Haluzak and Voss:

Claim 13 recites "flow modification features associated with either or both of said fuel flow channel and said cathode air flow channel, said flow modification features being configured to distribute a flow or fuel or air emerging from an inlet across a width of said fuel flow channel or said air flow channel, respectively." The final Office Action concedes that Haluzak does not teach this subject matter. (Action of 8/30/06, p. 5). Consequently, the Action cites to Voss, in combination with Haluzak, in this regard.

However, the combination of Haluzak and Voss still fails to teach or suggest the subject matter of claim 13. Voss merely teaches "baffle plates (18, 20) positioned in the housing (16) to divide the interior of the housing (16) into two or more gas flow chambers (24, 26, 28 each containing a stack (32, 34, 36) of heat exchange units." (Voss, abstract).

Thus, Voss teaches baffles that define individual flow chambers. Voss does not, however, teach or suggest that these baffles "distribute a flow or fuel or air emerging from an inlet across a width of said fuel flow channel or said air flow channel, respectively" as claimed. Moreover, Voss does not teach or suggest any flow modification features in

connection with a fuel or air flow channel of a fuel cell stack that do perform this function or that have this capability as claimed.

Thus, the combination of Voss and Haluzak does not teach or suggest the flow modification features as now recited in claim 13. "To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)." M.P.E.P. § 2143.03. Accord. M.P.E.P. § 706.02(j). For at least this additional reason, the rejection of claims 13 and 14 should not be sustained.

Claim 29 is patentable over Haluzak and Nguyen:

Claim 29 recites "wherein said fuel flow channels or air flow channels comprise ports that can be opened or closed to selectively activate or deactivate each individual layer of said plurality of layers." The final Office Action concedes that Haluzak does not teach this subject matter. (Action of 8/30/06, p. 7). Consequently, the Action cites to Nguyen in this regard.

Nguyen teaches a method "for operating such a fuel cell system includes supplying fuel to the fuel inlets from a common source of fuel and supplying an oxidant to the oxidant inlets from a common source of oxidant. The outlets of a given cell are selectively opened to purge fuel product and oxidant product from the given cell while the outlets of other cells are kept closed." (Nguyen, abstract). Thus, Nguyen does not teach or suggest the ports that selectively activate or deactivate individual fuel cell layers as claimed. Rather, Nguyen merely teaches that, while all cells are operating, they can be individually purged of byproducts.

"To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580

(CCPA 1974)." M.P.E.P. § 2143.03. Accord. M.P.E.P. § 706.02(j). For at least this additional reason, the rejection of claim 29 should not be sustained.

In view of the foregoing, it is submitted that the final rejection of the pending claims is improper and should not be sustained. Therefore, a reversal of the final rejection of August 30, 2006 is respectfully requested.

Respectfully submitted,

DATE: December 20, 2006

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Rebecca R. Schow

VIII. CLAIMS APPENDIX

1. (original) A multi-cell fuel cell layer, comprising:

a substrate;

an array of fuel cells each having an anode, a cathode, and an electrolyte disposed on said substrate;

conductors electrically coupled to said fuel cell array;

a fuel flow channel defined in an anode side of said substrate; and

a cathode air flow channel defined in a cathode side of said substrate.

2. (original) The fuel cell layer of claim 1, further comprising a fuel inlet and an exhaust defined in said substrate.

3. (original) The fuel cell layer of claim 2, wherein said fuel inlet and said exhaust are in fluid communication with said fuel flow channel.

4. (original) The fuel cell layer of claim 2, further comprising a cathode air inlet and an excess cathode air outlet defined in said substrate.

5. (original) The fuel cell layer of claim 4, wherein said cathode air inlet and said excess cathode air outlet are in fluid communication with said cathode air flow channel.

6. (previously presented) The fuel cell layer of claim 4, wherein said fuel inlet and exhaust are defined in first and second opposing corner portions of said substrate and said

inlet cathode air and excess cathode air outlets are defined in third and fourth opposing corner portions of said substrate.

7. (previously presented) The fuel cell layer of claim 1, wherein said array of fuel cells are disposed within said fuel flow channel and said cathode air flow channel.

8. (previously presented) The fuel cell layer of claim 4, wherein said conductors comprise a positive conductor extending to said cathode air inlet and a negative conductor extending to said excess cathode air outlet.

9. (original) The fuel cell layer of claim 1, wherein said fuel flow channel is defined along a first axis and said cathode air flow channel is disposed along a second axis disposed at an angle with said first axis.

10. (original) The fuel cell layer of claim 9, wherein said first axis is substantially normal to said second axis.

11. (original) The fuel cell layer of claim 1, wherein said conductors are located on said cathode side of said substrate, said cathode side serving as a circuit side of said substrate.

12. (original) The fuel cell layer of claim 1, wherein said electrolyte seals non-active portions of said substrate.

13. (previously presented) The fuel cell layer of claim 1, further comprising flow modification features associated with either or both of said fuel flow channel and said cathode air flow channel, said flow modification features being configured to distribute a flow or fuel or air emerging from an inlet across a width of said fuel flow channel or said air flow channel, respectively.

14. (original) The fuel cell layer of claim 13, wherein said flow modification features comprise a plurality of baffles.

15. (original) The fuel cell layer of claim 1, wherein said conductors are located on said anode side of said substrate, said anode side serving as a circuit side of said fuel cell layer.

16. (previously presented) A fuel cell system, comprising:

a plurality of fuel cell layers each including an array of fuel cells each having an anode, a cathode, an electrolyte and conductors disposed on a substrate, a fuel flow channel defined in an anode side of said substrate, and a cathode air flow channel defined in a cathode side of said substrate,

wherein said fuel cell layers are alternatingly stacked.

17. (previously presented) The system of claim 16, wherein said fuel cell layers are coupled such that a fuel cell layer shares a fuel flow channel with a first adjacent fuel cell layer thereby forming a fuel flow plenum.

18. (original) The system of claim 17, wherein said fuel cell layers are coupled such that a fuel cell layer shares a cathode air flow channel with a second adjacent fuel cell layer thereby forming a cathode air flow plenum.

19. (original) The system of claim 18, further comprising fuel inlets and exhausts defined in said substrates.

20. (original) The system of claim 19, wherein a plurality of said fuel inlets form a fuel inlet plenum and a plurality of said exhausts form an exhaust plenum.

21. (original) The system of claim 20, wherein said fuel inlet plenum and said exhaust plenum are in fluid communication with said fuel flow plenums.

22. (original) The system of claim 21, further comprising cathode air inlets and excess cathode air outlets defined in said substrates.

23. (original) The system of claim 22, wherein a plurality of said cathode air inlets form a cathode air inlet plenum and a plurality of said excess cathode air outlets form an excess cathode air outlet plenum.

24. (original) The system of claim 23, wherein said inlet cathode air plenum and said excess cathode air outlet plenum are in fluid communication with said cathode air flow plenums.

25. (previously presented) The system of claim 24, wherein said conductors further comprise a positive conductor on each of said fuel cell layers extending to said cathode air inlets and a negative conductor on each of said fuel cell layers extending to said excess cathode air outlets.

26. (previously presented) The system of claim 25, further comprising a positive stack connection coupled to each of said positive conductors through said inlet cathode air plenum and a negative stack connection coupled to each of said negative conductors through said excess cathode air outlet plenum.

27. (previously presented) The system of claim 26, wherein fuel inlets and exhausts are defined in first and second opposing corner portions of said substrates and said inlet cathode air inlets and excess cathode air outlets are defined in third and fourth opposing corner portions of said substrates.

28. (previously presented) The system of claim 27, wherein said inlets comprise ports that can be opened or closed to selectively activate or deactivate each individual layer of said plurality of layers.

29. (previously presented) The system of claim 16, wherein said fuel flow channels or air flow channels comprise ports that can be opened or closed to selectively activate or deactivate each individual layer of said plurality of layers.

30. (previously presented) The system of claim 16, wherein each of said fuel flow channels is defined along a first axis and each of said cathode air flow channels is defined along a second axis disposed at an angle with said first axis.

31. (original) The system of claim 30, wherein said first axis is substantially normal to said second axis.

32. (previously presented) The system of claim 16, wherein each of said cathode sides comprises a circuit side, wherein said conductors are located on said circuit side.

33. (original) The system of claim 16, wherein said electrolyte seals non-active portions of said substrate.

34. (original) The system of claim 16, further comprising:

a fuel inlet and an exhaust fluidly coupled to each said fuel flow channel;

a cathode air inlet and an excess cathode air outlet fluidly coupled to each said cathode air flow channel; and

seals disposed around said inlets, exhaust and outlet and around a perimeter of said fuel cell array.

35. (original) The system of claim 34, wherein said seals comprise an electrically conductive material.

36. (original) The system of claim 16, wherein said fuel cell layers are coupled so as to form a parallel electrical circuit.

37. (previously presented) The system of claim 24, further comprising a fuel manifold having a plurality of selectively opened inlet ports coupled to said fuel flow plenums disposed within said fuel inlet plenum, and an exhaust manifold having a plurality of selectively opened inlet ports coupled to said fuel flow plenums disposed within said exhaust plenum.

38. (original) The system of claim 37, further comprising a cathode air inlet manifold having a plurality of selectively opened inlet ports coupled to said cathode air flow plenums disposed within said cathode air inlet plenum, and an excess cathode air manifold having a plurality of selectively opened inlet ports coupled to said cathode air flow plenums disposed within said excess cathode air plenum.

39-60. (withdrawn)

61. (original) An electrochemical system, comprising:

means for supporting an array of fuel cells;

means defined in a first side of said support means for conveying cathode air across said array of fuel cells; and

means defined in a second side of said support means for conveying fuel across said array of fuel cells.

62. (original) The system of claim 61, further comprising means for removing electricity from said array of fuel cells.

63. (original) The system of claim 62, further comprising a plurality of said supporting means.

64. (original) The system of claim 63, wherein said plurality of supporting means comprises means for delivering and removing fuel and cathode air to and from said system.

65. (original) The system of claim 61, wherein said cathode air and said fuel flow in directions substantially normal to each other across cathodes and anodes of said fuel cells respectively.

IX. Evidence Appendix

None

X. Related Proceedings Appendix

None

XI. Certificate of Service

None